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EXAMINER

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ORIOL R. RIJKEN

Appeal 2015-004614
Application 13/107,596
Technology Center 3600

Before JAMES P. CALVE, GEORGE R. HOSKINS, and
SEAN P. O'HANLON, *Administrative Patent Judges*.

CALVE, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant appeals under 35 U.S.C. § 134 from the final rejection of claims 1, 2, 4, 5, 7, and 9. Br. 5. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

CLAIMED SUBJECT MATTER

Claims 1 and 9 are independent. Claim 1 is reproduced below.

1. A semi-submersible vessel comprising:
four pontoons arranged in a generally rectangular form;
a column at each corner of the rectangular form, each
column having a top, a bottom, and a generally
five-sided transverse cross section with four sides
disposed at a right angle to at least one adjacent
side and a fifth side on an outboard face of the
generally rectangular form disposed at 45 degrees
to each adjacent side; and,
at least one mooring line attached to the fifth side of each
column such that the angle in planform between
the mooring line and the fifth side of the column is
a right angle.

REJECTION

Claims 1, 2, 4, 5, 7, and 9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Huang (US 6,447,208 B1, iss. Sept. 10, 2002) and Wybro (US 7,140,317 B2, iss. Nov. 28, 2006).

ANALYSIS

The Examiner found that Huang teaches a semi-submersible vessel, substantially as recited in independent claims 1 and 9, including columns with polygonal cross-sections, but lacks the claimed arrangement of mooring lines. Final Act. 2–3. The Examiner found that Wybro teaches a similar semi-submersible vessel with at least one mooring line that is attached to an outboard side or face of a column such that an angle in planform between the mooring line and the outboard side of the column is at a right angle. *Id.* at 3. The Examiner determined it would have been obvious to provide such a mooring line in Huang to facilitate mooring and anchoring of a vessel. *Id.*

The issue before us is whether it would have been obvious to modify Huang's vessel to provide at least one mooring line attached to the outboard face and fifth side of each column such that the angle in planform between the mooring line and the fifth side of the column is a right angle, as recited in claims 1 and 9. As set forth in more detail below, we determine that the Examiner's reason for modifying Huang to provide this arrangement based on teachings of Wybro is not supported by a rational underpinning.

Huang discloses an *extended-base* tension leg platform (TLP) that supports an offshore platform. Huang, 1:9–12. Huang's TLP is anchored to the seabed by tendons that are attached to wings or arms that extend from columns on the buoyant pontoons. *Id.* at 2:8–15, 2:24–29, Fig. 2B, 3B. Wings 214, 316, 416, 564, 664, 764 extend from outward facing sides (the claimed fifth side) 226, 310, 410, 653, 753, of each column with connectors 224, 320, 420, 568, 668, 768 (778) at their distal ends for tendons to attach and secure the TLP to the sea floor. *E.g., id.* at 8:20–35, Figs. 3B, 4A, 6, 7.¹

The wings or arms are design[ed] to improve the overall stability of the substructure and to reduce motion relative to the seabed caused by wave, current and air action on the substructure and attached tendons. The reduced motion (translational or rotational or heave, roll and yaw) causes reduced moments on the tendons and both seabed and substructure tendon connections thereby improving tendon and connection lifetime by decreasing flex fatigue due to relative motion of the substructure relative to the seabed.

Id. at 4:55–63, *see id.* at 4:2–13. The wings increase the distance between tendons to reduce tendon fatigue. *Id.* at 6:48–53, 9:59–67, 10:30–41.

¹ The Examiner cited the embodiment of Figures 3A and 3B. Final Act. 2–3.

In view of these teachings, the Examiner's proposal to add mooring lines, fairleads, and winches of Wybro to Huang to "effectively facilitate mooring or anchoring the vessel to a seabed" and "facilitate improved mooring of the structure" (Final Act. 3–4) is not supported by a rationale underpinning. The Examiner has not explained sufficiently why a skilled artisan would have been motivated to modify Huang's extended arms/wings that secure a tendon anchoring system to stabilize the platform and reduce tendon fatigue, with Wybro's mooring lines, fairleads, and winches, which are designed to work without separate wings or tendons. Appeal Br. 12–13; Reply Br. 4. To the extent the Examiner proposes to replace the wings of Huang with Wybro's mooring arrangement, the Examiner has not explained why a skilled artisan would have been motivated to do so when Huang uses wings to stabilize and secure the TLP to the seabed with tendon connections.

The Examiner's finding that Wybro's fairleads 18 may be considered wings because the wings of Huang are used to attach mooring lines (Ans. 5) is not supported by a preponderance of evidence. Wybro distinguishes its mooring, which does not provide substantial vertical or rotational restraint, from that of Huang, which uses outwardly extending wings and tendons to restrain the platform against vertical and rotational motions. Wybro, 2:39–51, 7:21–27. Wybro places vertical columns outboard of the central pontoon (Fig. 5) to provide some rotational stability without arms/wings. *Id.* at 2:48–51, 3:65–4:5, 6:13–29. Thus, Wybro uses support columns 12 to stabilize the platform, obviating the need for separate arms as in Huang. However, Wybro's mooring system does not provide substantial restraint in contrast to Huang's tendon system. Wybro, 2:39–51; Appeal Br. 12–13; Reply Br. 3–5.

Huang does teach that the wings increase the radial extension of the substructure between 10% and 100%. Huang, 4:64–5:8; Ans. 6 (suggesting using smaller wings in Huang similar to fairleads in Wybro). Even if shorter wings in Huang are considered as an extension of the outboard facing side of each vertical column, the Examiner has not established that Huang's tendons or Wybro's mooring lines would have formed a right angle in planform with the fifth side of each column, as claimed. Ans. 6. Huang places tendons on lateral sides of each arm, rather than the outboard side, and does not show how the tendons extend from these connectors. Huang, Figs. 3B, 4A, 5–7; Reply Br. 4–5. We are not persuaded that placing mooring on an outboard side of a column of Huang, as taught by Wybro, would improve rotational stability (Ans. 5) when Huang places pairs of tendons on opposing lateral faces of each arm to improve rotational stability, and Wybro teaches that its arrangement does not promote rotational stability, as compared to Huang's system. Huang, 8:9–44, 10:28–44, Figs. 3B, 6; Wybro, 2:39–51. Nor are we persuaded that modifying Huang's tendon system that attaches directly to lateral sides of each arm with Wybro's winches and fairleads that run along the longitudinal axis of the outboard side of each column would simplify construction of each vessel as the Examiner found. *See* Ans. 6; Reply Br. 5 (no benefit to using Wybro's mooring system on Huang).

Thus, we do not sustain the rejection of claims 1, 2, 4, 5, 7, and 9.

DECISION

We reverse the rejection of claims 1, 2, 4, 5, 7, and 9.

REVERSED